



CATALOGUE OF THE
SCHOOL OF
PUBLIC HEALTH



VOLUME V

MAY, 1919

NUMBER 1

HARVARD UNIVERSITY
AND THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CATALOGUE
AND
ANNOUNCEMENT

1919-20



1.Mhc, 1913.2

PUBLISHED BY THE
HARVARD-TECHNOLOGY
SCHOOL OF PUBLIC HEALTH

240 LONGWOOD AVENUE, BOSTON, MASS.

1919

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OF
HARVARD UNIVERSITY
AND THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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CALENDAR

HARVARD UNIVERSITY

1919

Sept. 22, Mon. ACADEMIC YEAR BEGINS in all departments of the University.

RECESS FROM DECEMBER 23 TO JANUARY 2, INCLUSIVE

1920

Jan. 22, Thurs. Mid-year Examinations begin.

Feb. 2, Mon. Second half-year begins in the Medical School.

Feb. 9, Mon. Second half-year begins in the Engineering School.

RECESS FROM APRIL 18 TO APRIL 24, INCLUSIVE

June 1, Tues. Examinations begin in the Medical School.

June 24, Thurs. COMMENCEMENT.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

1919

Oct. 6, Mon. FIRST TERM BEGINS.

Dec. 17-23 Semi-annual Examinations.

Dec. 24 to Jan. 4 Christmas vacation.

1920

Jan. 5, Mon. SECOND TERM BEGINS.

RECESS FROM MARCH 14 TO MARCH 21, INCLUSIVE

Mar. 22, Mon. THIRD TERM BEGINS.

June 1, Tues. Last exercises of third term.

June 2 to June 15 Annual Examinations.

June 11, Fri. COMMENCEMENT.

EXERCISES ARE SUSPENDED ON LEGAL HOLIDAYS

THE SCHOOL OF PUBLIC HEALTH

HARVARD UNIVERSITY AND THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

ABBOTT LAWRENCE LOWELL, LL.D., Ph.D., *President of Harvard University.*

RICHARD COCKBURN MACLAURIN, LL.D., Sc.D., *President of the Massachusetts Institute of Technology.*

The names of the Administrative Officers and Governing Boards of Harvard University will be found in the Official Register of Harvard University; and of the Administrative Officers and Governing Boards of the Massachusetts Institute of Technology, in the Official Bulletin of the Massachusetts Institute of Technology.

MILTON J. ROSENAU, M.D., A.M., *Director.*

ADMINISTRATIVE BOARD

WILLIAM T. SEDGWICK, Sc.D., *Chairman.*

MILTON J. ROSENAU, M.D., A.M., *Director.*

GEORGE C. WHIPPLE, S.B., *Secretary.*

OFFICE HOURS

The office of the School of Public Health is at the office of the Director, Professor ROSENAU, Harvard Medical School, Building E, Room 238, 240 Longwood Avenue, Boston, where the business of the School is conducted.

The office of the Chairman, Professor SEDGWICK, is at Room 10-405, Massachusetts Institute of Technology, Charles River Road, Cambridge.

The office of the Secretary, Professor WHIPPLE, who is also acting as Treasurer, is at Room 112, Pierce Hall, Oxford Street, Cambridge.

The office of the Assistant Secretary, Professor TURNER, is at the Harvard Medical School, 240 Longwood Avenue, Boston.

OFFICERS OF INSTRUCTION AND LECTURERS

(Arranged alphabetically)

ROBERT P. BIGELOW, S.B., PH.D., *Associate Professor of Zoölogy and Parasitology, Massachusetts Institute of Technology.*

HUGH CABOT, A.B., M.D., *Clinical Professor of Genito-Urinary Surgery, Harvard University.*

RICHARD C. CABOT, A.B., M.D., *Professor of Clinical Medicine, Harvard University.*

IDA CANNON, *Head Worker, Social Service Department, Massachusetts General Hospital.*

WALTER B. CANNON, A.M., M.D., *George Higginson Professor of Physiology, Harvard University.*

CHARLES V. CHAPIN, M.D., S.D., *Superintendent of Health, Providence, R. I.*

CECIL K. DRINKER, M.D., *Associate Professor of Applied Physiology, Harvard University.*

DAVID L. EDSALL, A.M., M.D., S.D., *Jackson Professor of Clinical Medicine, and Dean of the Harvard Medical School.*

HAROLD C. ERNST, M.D., A.M., *Professor of Bacteriology, Harvard University.*

GORDON M. FAIR, *Instructor in Sanitary Chemistry, Harvard University, and Sanitary Inspector, Harvard University.*

WALTER E. FERNALD, A.B., M.D., *Superintendent, Massachusetts School for the Feeble-Minded.*

OTTO FOLIN, S.B., PH.D., *Hamilton Kuhn Professor of Biological Chemistry, Harvard University.*

ALICE HAMILTON, M.D., *Assistant Professor of Industrial Medicine, Harvard University.*

JOHN B. HAWES, 2D, A.B., M.D., *Secretary, Board of Trustees, Massachusetts Hospital for Consumptives.*

MURRAY P. HOROWITZ, S.B., *Instructor in Bacteriology and Public Health, Massachusetts Institute of Technology.*

EUGENE R. KELLEY, M.D., *Commissioner of Health, Massachusetts State Department of Health.*

ROBERT W. LOVETT, A.B., M.D., *John B. and Buckminster Brown Professor of Orthopedic Surgery, Harvard University.*

GEORGE B. MAGRATH, M.D., *Medical Examiner of Suffolk County.*

JOHN L. MORSE, A.M., M.D., *Professor of Pediatrics, Harvard University.*

EDWARD MUELLER, PH.D., *Assistant Professor of Inorganic Chemistry, Massachusetts Institute of Technology.*

EDWIN H. PLACE, M.D., *Assistant Professor of Pediatrics, Harvard University, and Physician-in-Chief, South Department, Boston City Hospital.*

*WILLIAM H. POTTER, D.M.D., *Professor of Operative Dentistry, Harvard University.*

SAMUEL C. PRESCOTT, S.B., *Professor of Industrial Microbiology, Massachusetts Institute of Technology.*

MILTON J. ROSENAU, M.D., A.M., *Professor of Preventive Medicine and Hygiene, Harvard University.*

M. VICTOR SAFFORD, M.D., *Epidemiologist, Boston Board of Health.*

WILLIAM T. SEDGWICK, PH.D., Sc.D., *Professor of Biology and Public Health, Massachusetts Institute of Technology.*

A. WATSON SELLARDS, A.M., M.D., *Assistant Professor of Tropical Medicine, Harvard University.*

FRANCIS H. SLACK, M.D., *Instructor in Public Health Laboratory Methods, Massachusetts Institute of Technology.*

PERCY G. STILES, S.B., PH.D., *Instructor in Physiology, Harvard University and Radcliffe College.*

*RICHARD P. STRONG, PH.B., M.D., S.D., *Professor of Tropical Medicine, Harvard University.*

C. ELSMERE TURNER, A.M., C.P.H., *Assistant Professor of Biology and Public Health, Massachusetts Institute of Technology; Assistant Professor of Hygiene, Tufts College Medical School; Assistant Secretary, School of Public Health.*

ERNEST E. TYZZER, M.D., *George Fabyan Professor of Comparative Pathology, Harvard University.*

* Absent on War Service.

FREDERICK H. VERHOEFF, A.M., M.D., *Assistant Professor of Ophthalmic Research, Harvard University.*

EUGENE WAMBAUGH, A.M., LL.B., LL.D., *Langdell Professor of Law, Harvard University.*

WOLFERT G. WEBBER, A.B., M.D., *Charles Follen Folsom Teaching Fellow in Hygiene, Harvard University.*

GEORGE C. WHIPPLE, S.B., *Gordon McKay Professor of Sanitary Engineering, Harvard University.*

MELVILLE C. WHIPPLE, *Instructor in Sanitary Chemistry, Harvard University.*

S. BURT WOLBACH, M.D., *Associate Professor of Bacteriology, Harvard University.*

ALPHEUS G. WOODMAN, S.B., *Associate Professor of the Chemistry of Foods, Massachusetts Institute of Technology.*

WILLIAM C. WOODWARD, M.D., LL.M., *Health Commissioner, City of Boston.*

GENERAL INFORMATION

The School of Public Health is conducted by Harvard University and the Massachusetts Institute of Technology through an Administrative Board appointed for this purpose by both institutions.

The principal object of the School is to prepare young men and women for public health work and especially to fit them to occupy administrative, executive, or laboratory positions, as health officials, or as members of boards of health, or secretaries, agents, laboratory workers, or inspectors of health organizations. To this end, lectures, laboratory work, and other forms of instruction are offered by both institutions, and by special instructors from national, state, and local health agencies. The subjects embraced in the courses of study have been selected to cover a wide range, including medical, biological, sanitary, hygienic and engineering sciences, together with practical public health administration and research.

It is recognized that the requirements for public health service are broad and varied, and that the country needs leaders in every community fitted to guide and instruct the people in the art of hygienic living, qualified to direct the expenditure of energy, time, and money in public health work into fruitful channels, and able to initiate plans to meet novel conditions as they arise. It is the object of the School of Public Health to provide the scientific ground work of expert knowledge which underlies efficient health administration, together with some actual personal acquaintance with the theory and practice of modern public health service of the best types.

Harvard University with its extensive resources affords ample opportunities for students to prepare themselves in the medical aspects of public health work and the important subjects of vital statistics and demography. The Massachusetts Institute of Technology, with its courses in municipal sanitation, bacteriology, and public health, presents the engineering and laboratory phases. The new courses in Industrial Hygiene offered by the Harvard Medical School are open to students registered in the School of Public Health.

The new Harvard Engineering School furnishes instruction in Sanitary Engineering. Special courses in Water Works Engineering, Sewerage Engineering, Water Purification and Sewerage Treatment are also open to properly qualified students. Details of these courses may be found in the catalogue of the Harvard Engineering School. The State of Massachusetts and the City of Boston afford unusual opportunities to study the operation and administration of state and municipal departments of health, including hygienic laboratory work. In connection with

the port of Boston the United States Public Health Service maintains a Marine Quarantine, Immigration, and Medical Service. The School of Public Health is thus in a unique position in being able to offer all of these and many other special opportunities for public health practice.

REQUIREMENTS FOR ADMISSION

Students are admitted to the School of Public Health with various degrees of preliminary training. The time which may be required to obtain the Certificate in Public Health will be largely dependent upon the preliminary training of the applicant. Students with a medical degree require at least one year in residence. Other students as a rule will require two or more years.

Students are admitted to the School if they have satisfactorily completed two years work in a recognized medical school, or if they have received a bachelor's degree from a recognized college or technical school, or if they have had special experience in public health work, provided they have pursued satisfactory courses in physics, chemistry, biology, and modern languages and the fundamental medical sciences.

The medical degree is not a prerequisite for the Certificate in Public Health, but candidates are advised to obtain the medical degree if possible before specializing in public health work. Experience teaches that at present preferment for employment and advancement to the higher positions come more readily to those who possess medical degrees.

Special students, not candidates for the Certificate in Public Health, who desire to fit themselves for some particular field will be admitted to the School, and may take any course or courses for which they are qualified, on approval of the Administrative Board.

ADMISSION OF WOMEN

Women are admitted to the School of Public Health on the same terms as men, and are equally eligible for the Certificate in Public Health. They are admitted to many of the courses given in the Harvard Graduate School of Medicine and to all courses at M. I. T.

The world war has created an unusual opportunity for women to enter upon public health work, and there is every indication that much of the work in this field now done by men must soon be taken up by women. Laboratorians, public health nurses, and inspectors of various kinds, seem likely to be in special request.

APPLICATION AND REGISTRATION

Application for admission to the School should be made to the Director, and should be accompanied by a full statement of the applicant's qualifications, including his or her academic history together with such certificates from other institutions as the Administrative Board may require.

Each student before being admitted to courses of instruction must register at the office of the Director and obtain a card, to be presented to instructors.

Students in the School of Public Health are registered as students of both Harvard University and the Massachusetts Institute of Technology.

CERTIFICATE

The Certificate in Public Health (C. P. H.) will be granted to candidates * who have satisfactorily completed the studies of their approved schedule, who have spent not less than one academic year in residence, and who have otherwise complied with all requirements. This certificate is issued by Harvard University and the Massachusetts Institute of Technology and signed by the President of each institution and by the members of the Administrative Board.

FEES

The tuition fee for candidates for the Certificate in Public Health and for all other students pursuing regular courses in the School is \$250 per year and must be paid in advance as follows: — \$150 on or before the first day of the first term, and \$100 on or before the first day of the second term. For one-half of the school year the fee is \$150; for one-third of the year, \$90.

Special students who do not pay the regular fee must pay a special fee for each course.

A deposit of \$25 is required against charges for use of materials and breakage in the laboratories, of which any balance remaining at the end of the year will be returned. There are no extra laboratory fees for instruction taken in course.

All fees must be paid to Professor Whipple, Treasurer of the School. Checks should be made payable to the School of Public Health.

* Students who enter the School for the purpose of taking only special studies are not regarded as candidates.

FELLOWSHIPS AND SCHOLARSHIPS

One fellowship of \$500, which carries with it exemption from tuition fees, will be awarded during the year 1919-20 by the Administrative Board of the School. The holder of this fellowship will be expected to devote the greater part of his time to research in some field of public health science.

One fellowship of \$250, made available through the generosity of Mr. James M. Heatherton, of New York City, will be awarded during the year 1919-20 by the Administrative Board of the School. The holder of this fellowship must devote a considerable part of his time to research relating to some branch of plumbing.

One scholarship of \$250, i. e., the equivalent of one year's tuition, will be awarded by the Administrative Board of the School during the year 1919-20.

Applications for fellowships and scholarships should be made to the Director.

DIVISION OF STUDIES

Two programs or schedules of studies are provided in the School, one for students who have previously obtained the medical degree and one for students who have not. All candidates for the Certificate in Public Health must follow one or the other of these schedules, and in addition may take a certain number of elective courses. Students who do not follow one or the other of these schedules will be classified as special students, and will not be considered as candidates for the Certificate in Public Health.

REQUIRED WORK

The schedules of courses, which must be completed by candidates for the C. P. H. are indicated on page 14. In addition to this required work, each student may select courses, known as elective courses, but in no case shall the total number of hours taken exceed *thirty hours a week* except by special vote of the Administrative Board. After such optional courses have been elected the student must complete these courses, and in no case will be allowed to change them without a vote of the Administrative Board.

EXAMINATIONS

Written examinations may be given by the various instructors during or at the end of their particular courses. On the completion of the work of each term every student in the School must also present himself before the members of the Administrative Board for an oral examination on the work just completed. In the case of those students who present themselves for final examination, there will be a general oral examination covering all of the work taken during residence in the School.

RESEARCH PROBLEM

No student will be granted a Certificate in Public Health, who has not during his residence in the School completed a satisfactory thesis. This must be presented to the Administrative Board in due form and must have received the approval of the Board before the final examination will be given. This work may be in the nature of a sanitary survey, a detailed study of some particular problem in public health, or an original piece of laboratory investigation. All subjects must be first approved by the Administrative Board.

SPECIAL LECTURES AND SEMINARS

In addition to the courses already indicated special lectures will be given at various times during the year, in most instances from five to six o'clock. These lectures will require no preparation on the part of the student, but are designed to familiarize him with various fields of activity related to public health work. The lecturers in each instance will be experts, actively engaged in practical work. A list of such lectures will be found on page 23.

Seminars are held by the Director on the second and fourth Thursday evenings of each month throughout the year. At these seminars current literature and original work will be reviewed by members of the instructing staff and by members of the School of Public Health. Professor Edsall offers seminars in Industrial Hygiene every other Friday evening. Such lectures and seminars are a part of the regular work of the School and attendance is expected of all students.

These courses are not reckoned in the total number of hours allowed in selecting elective courses, nor do they count toward the Certificate in Public Health.

ADDITIONAL COURSES

Students may take other courses at Harvard University or at the Massachusetts Institute of Technology, but in all such cases registration must be made through the office of the Director. For additional courses consult catalogues of the two institutions.

SCHEDULE OF COURSES

(For description of courses, see pp. 17 to 22)

HARVARD MEDICAL SCHOOL

FIRST TERM (October–February)

Course No.	Subject	Hours per week
111a	Preventive Medicine and Hygiene, (1)*	6
111c	Evening Journal Club
114	Tropical Medicine
412	Wasserman Laboratory Work	6†
413	Bacteriology	17‡
425	Pathology, (3)	24

SECOND TERM (February–June)

111b	Preventive Medicine and Hygiene (conference), (1, 3)	1
310	Public Health Administration, (1, 3)	4
111c	Evening Journal Club

* A numeral following the name of a course indicates that this course is required of a special group of students. The first group includes students who hold the degree of M.D. and who are candidates for the C.P.H. The second group includes students, in their first year, who do not hold the degree of M.D. The third group includes students who do not hold the degree of M.D. who are candidates for the C.P.H.

† Daily during October and November.

‡ Part of term.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

FIRST TERM (October–December)

Course No.	Course	Hours per week
415	Anatomy and Histology, (2)	8
711	Municipal Sanitation	2
812	Vital Statistics	3
414	Bacteriology	6
613	Parasitology	1
417	Bio-chemistry	3
210	Personal Hygiene, (1, 2)	3
311	Socio-Sanitary Problems	4

SECOND TERM (January–March)

210	Personal Hygiene, (1, 2)	3
112	Problems and Practice in Public Health	3
211	Industrial Hygiene	3
415	Anatomy and Histology, (2)	8
418	Public Health Laboratory Methods	6
419	Physiology	6
420	Physiological Laboratory.	2
421	Food Analysis	5
612	Biology of Disease.	2
711	Municipal Sanitation	2
414	Bacteriology	6
613	Parasitology	1

THIRD TERM (April–June)

110	Principles of Sanitary Science and Public Health	1
112	Problems and Practice in Public Health, (2)	3
415	Anatomy and Histology	8
418	Public Health Laboratory Methods, (1, 2)	6
419	Physiology, (2)	6
612	Biology of Disease	2
711	Municipal Sanitation	2
414	Bacteriology	6
416	Analysis of Water, Sewage and Air	4
613	Parasitology	1

HARVARD UNIVERSITY, CAMBRIDGE

FIRST TERM (October–February)

Course No.	Course	Hours per week
411	Laboratory Technique	6
810	Vital Statistics, (1, 2)	6
423	Sanitary Chemistry and Biology	9
710	Sanitary Engineering, (1, 2)	3
212	Industrial Sanitation	3

SECOND TERM (February–June)

424	Bacteriology (Elementary)	9
710	Sanitary Engineering	9

COURSES GIVEN AT OTHER PLACES

312	Social Service Work at Massachusetts General Hospital, (1, 3)	6
610	Communicable Diseases at City Hospital (1, 2) .	3
611	Communicable Diseases Internship at Hospital.	..
422	Hygienic Laboratory Methods at State Hygienic Laboratory

DESCRIPTION OF COURSES

The courses are here arranged according to groups. Complete descriptions are given of only those courses which are required or elective. Courses of interest to special students or to regular students having time for extra work are listed by title only. Description of these may be found in the catalogues of the institutions.

PREVENTIVE MEDICINE AND SANITARY SCIENCE

110. *Principles of Sanitary Science and Public Health.* (Required.)

M. I. T. 756, one hour per week, third term. Professor SEDGWICK.

A general course dealing briefly with health and disease; ancient and modern theories of disease; parasitism; toxins and antitoxins; theories of vital resistance and immunity; vaccination; epidemiology; and preventive sanitation of water supplies, milk supplies and waste disposal, etc.

111a. *Preventive Medicine and Hygiene.* (Required.)

Harvard Medical School, six hours per week, first term. Professor ROSENAU and assistants.

This is a general course, consisting of lectures, demonstrations, and laboratory work designed to give a bird's-eye view of the important facts and principles in preventive medicine. The subjects covered are those found in Rosenau's "Preventive Medicine and Hygiene." A sanitary survey forms an integral part of this course.

111b. *Preventive Medicine and Hygiene.* (Required.)

Harvard Medical School, one hour per week, second term. Professor ROSENAU.

This is a seminary course given especially for students in the School of Public Health as a supplement to 111a.

111c. A Thursday Evening Journal Club meets at the residence of Professor ROSENAU, on the first and third Thursday of each month.**112.** *Problems and Practice in Public Health.* (Required.)

M. I. T., three hours per week, second and third terms. Professor SEDGWICK.

The course is essentially one in the theory and practice of Hygiene and Sanitation, with discussions of the origin and trend of the underlying principles of sanitary science, public health science and vital statistics.

Special attention is given to current problems of public health science and practice.

114. *General Course in Tropical Medicine.*

(Offered by the School of Tropical Medicine, and open to students registered in the School of Public Health.)

Given at the Harvard Medical School on dates to be announced.
Professor STRONG.

PERSONAL HYGIENE

210. *Personal Hygiene.* (Required.)

M. I. T., three hours per week, second term. Professor SEDGWICK.

The course includes a thorough discussion of such topics as the choice of foods, the effects of good and bad air upon the body, muscular activity, fatigue, sleep, rest, recreation, the care of the eyes and other sense organs, bathing and baths, the dangers of sedentary life, and similar subjects bearing upon individual hygiene.

211. *Industrial Hygiene.* (Optional.)

M. I. T., three hours per week, second term. Professor TURNER and assistants.

The effect of factory life upon health, including occupational accidents, industrial poisonings, and the effects of ventilation and of dusty trades upon the prevalence of tuberculosis and other diseases.

212. *Industrial Sanitation.* (Required.)

Harvard University, Cambridge, three hours per week, first term.
Professor WHIPPLE and assistants.

During 1919-20 this course will be confined to such subjects as the quality of water, distribution of water, plumbing, sewerage and sewage disposal for industrial plants.

PUBLIC HEALTH ADMINISTRATION

310. *Public Health Administration.* (Required.)

Harvard Medical School, four hours per week, second term. Professor TURNER and others.

Lectures given on the administrative control of the various communicable diseases, as well as public health field work. Organization of Federal, State, and Municipal Departments of health is also taken up and analyzed. Special exercises are given at the State Department of Health, by Dr. EUGENE R. KELLEY, and at the Boston Board of Health, by Dr. WILLIAM C. WOODWARD.

311. *Socio-Sanitary Problems.* (Optional.)

M. I. T., four hours per week, first term. Professor TURNER.

Lectures and conferences on the relationship of Public Health work to poverty, alcoholism, drug addiction, unemployment, underemployment, wages, and other social and economic problems.

312. *Social Service Work.* (Optional.)

Massachusetts General Hospital, six hours per week, part of term.

Miss IDA C. CANNON and assistants.

Lectures, talks, and demonstrations will be given to show the practical relationship between the work of the social service worker and the public health worker. Clinics will also be given in those diseases which are of particular interest to students in public health.

LABORATORY COURSES

411. *Laboratory Technique.* (Required.)

Harvard University, six hours per week, first term. Mr. MELVILLE C. WHIPPLE.

The purpose of this course is to give training in the fundamentals of laboratory methods, both bacteriological and chemical. The work includes the use of the chemical balance, the preparation and standardization of reagents, quantitative analysis, the use of the microscope, the preparation of culture media, the use of incubators and the equipment of laboratories.

412. *Wasserman Laboratory Work.* (Optional.)

Harvard Medical School, six hours per week, first term. Dr. HINTON.

The work in this course includes lectures, demonstrations, and actual laboratory work. It is designed to give the student a general knowledge of and training in the Wasserman technique.

413. *Elementary and General Bacteriology.* (Optional.)

Harvard Medical School, daily except Saturday during October and November, from 2 to 5.30 P.M. Professors ERNST, WOEBACH, and others.

414. *Bacteriology.* (Optional.)

M. I. T., six hours per week throughout the year. Professor Prescott and assistants.

A course in elementary bacteriology with a consideration of special fields of applied bacteriology, such as dairy bacteriology and the bacteriology of air, water, and foods.

- 415. *Anatomy and Histology.*** (Required of non-medical students.)
M. I. T., eight hours per week, throughout the year. Professor BIGELOW.

A course designed to give the student a grasp of the structure of the vertebrates, and a sufficient knowledge of mammalian (including human) anatomy to form a sound basis for subsequent study of physiology, pathology, and personal hygiene.

- 416. *Analysis of Water, Sewage and Air.*** (Optional.)
M. I. T., four hours per week, third term. Professor WOODMAN and Mr. WAREHAM.

The chemical examination of potable water, of sewage and of air, with discussions of methods of analysis and the sanitary significance of results.

- 417. *Bio-Chemistry.*** (Optional.)
M. I. T., three hours per week, first term. Professor MUELLER.

Conferences and reading on the most important phases of Biological Chemistry. The chemistry of plant and animal life and of the metabolic processes. Physico-chemical topics such as osmotic pressure, adsorption, diffusion and colloidal chemistry, bacterial metabolism, toxins, ptomaines, etc., are considered.

- 418. *Public Health Laboratory Methods.*** (Required.)
M. I. T., six hours per week, second and third terms. Dr. SLACK.

Training is given in the cultural diagnosis of diphtheria, examination of specimens for tuberculosis, the Widal reaction in typhoid fever, the microscopical diagnosis of malaria, the complement fixation test, etc.

- 419. *Physiology.*** (Required of non-medical students.)
M. I. T., six hours per week, second term.

- 420. *Physiological Laboratory.*** (Required of non-medical students.)
M. I. T., two hours per week, second term.

- 421. *Food Analysis.*** (Optional.)
M. I. T., three hours per week, second term. Professor WOODMAN.

Lectures and laboratory work dealing with the character, purity, and nutritive value of common food materials and with food adulteration.

- 422. *Hygienic Laboratory Methods.*** (Optional.)
State Hygienic Laboratory. Professor ROSENAU and assistants.

423. *Sanitary Chemistry and Biology.* (Optional.)

Harvard University, Cambridge, nine hours per week, first term.
Mr. MELVILLE C. WHIPPLE.

This is a thorough course in water and sewage analysis, and in the analysis of air.

424. *Bacteriology.* (Optional.)

Harvard University, Cambridge, nine hours per week, second term.
Mr. M. C. WHIPPLE.

A course in elementary bacteriology.

425. *Pathology.* (Required of non-medical students.)

Harvard Medical School, twenty-four hours per week, first term.
Dr. COUNCILMAN and assistants.

COMMUNICABLE DISEASES

610. *Communicable Diseases. — Clinical Course.* (Required.)

South Department, Boston City Hospital, 745 Massachusetts Ave.,
Three hours per week first term. Dr. PLACE.

This course offers an opportunity for the detailed study of the more common contagious diseases, more especially measles, scarlet fever, diphtheria, whooping cough, etc. Their recognition, variation, complications, manner of spread and treatment will be studied at the bedside and in short conferences after the ward visits.

611. *Communicable Diseases. — Internship.*

South Department, Boston City Hospital, 745 Massachusetts Ave.
one to four months, as arranged by agreement.

For qualified students registered in the School of Public Health.

612. *Biology of Disease.* (Required of non-medical students.)

M. I. T., two hours per week, second and third terms. Dr. SLACK.

This course deals with the fundamental biological facts of infection, resistance, and immunity. It also deals specifically with the biological characteristics of infectious diseases of special interest to the sanitarian.

613. *Parasitology.* (Optional.)

M. I. T., one hour per week, throughout the year. Professor BIGELOW.

A course on parasitism and parasites with special reference to the forms most often met with in the important parasitic diseases of men and domestic animals.

SANITARY AND MUNICIPAL ENGINEERING

710. *Sanitary Engineering.* (Required.)

Harvard University, Cambridge, three exercises a week, first term, nine hours, second term. Professor WHIPPLE and assistants.

A comprehensive course in sanitary engineering.

711. *Municipal Sanitation.* (Optional.)

M. I. T., two hours per week throughout the year. Professors SEDGWICK, TURNER, and Mr. HOROWITZ.

The topics considered will include city planning, housing, fire prevention, street paving, public water supplies and water purification, the pollution of streams, methods of sewage disposal, garbage disposal, street cleaning, hygienic housing, plumbing, ventilation, the effect of insanitary conditions on the public health.

712. *Research in Sanitation.* (Harvard University, Hygiene and Sanitation, 20a.)

Professor WHIPPLE.

Opportunities are offered for properly qualified students to undertake research work in the Sanitary Engineering Laboratories of the Harvard Engineering School.

DEMOGRAPHY

810. *Vital Statistics.* (Required.)

Harvard University, Cambridge, six hours per week, first term. Professor WHIPPLE and assistants.

A course in vital, social, and sanitary statistics arranged especially for students who intend to enter the public health service. It will treat of the principles of statistics, population, registration, births and marriages, general death rates, specific death rates, morbidity, causes of death, preparation of tables, plotting, construction of diagrams, graphical display of data, and, in general, the application of statistics to state and municipal problems.

Text-book. Whipple's "Vital Statistics."

811. *Research in Demography.*

Harvard University, Cambridge, during the second term on dates to be arranged. Professor WHIPPLE and assistants.

For students registered in the School of Public Health.

812. *Vital Statistics.* (Optional.)

M. I. T., three hours per week, first term.

FIVE O'CLOCK LECTURES

Students do not register for the following lecture courses. From one to six lectures will be given on each of the following subjects. The usual hour for lectures is from five to six o'clock. The dates and places will be announced. All students are expected to attend.

In the last series these lectures were as follows:

Infant Mortality	Professor JOHN L. MORSE
Legal Medicine	Dr. GEORGE B. MAGRATH
Medical Inspection of Aliens	Dr. M. V. SAFFORD
Municipal Sanitation	Dr. C. V. CHAPIN
Ocular Hygiene	Dr. F. H. VERHOEFF and Dr. LOUIS BELL
Oral Prophylaxis	Professor W. H. POTTER
Posture and Deformities	Professor R. W. LOVETT
Sanitary Law — Legal Powers of Health Officers	Professor EUGENE WAMBAUGH
Social Service Work	Professor RICHARD C. CABOT
Tuberculosis	Dr. J. B. HAWES, 2d.
Venereal Prophylaxis	Dr. HUGH CABOT

COURSES IN INDUSTRIAL HYGIENE

In addition to the courses described in this catalogue, important courses in Industrial Hygiene, given at the Harvard Medical School, are open to students in the School of Public Health.

Description of these courses may be found in a special catalogue published by the Committee on Industrial Hygiene, and to be obtained from Dr. C. K. DRINKER, Harvard Medical School, 240 Longwood Ave., Boston.)

Applied Physiology
 Methods of Air Analysis
 Industrial Toxicology
 Industrial Health Administration
 Industrial Surgery
 Workmen's Compensation and the Legal Aspects of
 Industrial Diseases
 Nutrition
 Orthopedic Surgery

STUDENTS 1918-19

Most of the following students were registered during the summer and autumn of 1919, in "War Bacteriology" largely in response to calls from the Medical Department of the U. S. Army for Laboratory Technicians.

JULY-SEPTEMBER, 1918

- Adams, Helen C., R.N., formerly Public Health Nurse, School Department, Wellesley, Mass. Chief Nurse, Du Pont Hospital, Old Hickory Works, Jacksonville, Tenn.
- Atwood, Catherine, A.B. Wellesley College. Laboratory Technician, Base Hospital, Camp Devens, Mass.
- Batt, Louise M., A.B. Wellesley College. Assistant Bacteriologist, State Board of Health, Jacksonville, Florida.
- Bradley, Rosamund. Formerly Red Cross worker in France. Training School for Nurses, Johns Hopkins Hospital, Baltimore.
- Chisholm, Alva N. Valparaiso University, Indiana. Laboratory Technician, Camp Hancock, Ga.
- Coolidge, Isabel. Radcliffe College. Red Cross worker in France.
- Coolidge, Julia S. Massachusetts General Hospital. Boston.
- Davis, Anna J., B.S. Simmons College. Sanitary Inspector, Richmond, Va.
- Dean, Miriam I., A.B. Wellesley College. Assistant, Botanical Department, Wellesley College.
- Fuller, Rhea Ruth, A.B. Radcliffe College. Assistant, Industrial Clinic, Massachusetts General Hospital.
- Furber, Jane M., A.B. Wellesley College. Assistant, Massachusetts General Hospital.
- Hale, Amy E., A.B. Oberlin College. Laboratory Technician, Base Hospital, Camp Devens, Mass.
- Hale, Annie P. Special student, M. I. T. Assistant in Dehydration Investigations, U. S. Department of Agriculture.
- Hatch, Ruth E., A.B. Wellesley College. Research Worker, Forsyth Dental Infirmary, Boston.
- Hunt, Frank S., S.B. Pratt Institute, Peabody, Mass.
- Knobel, Edward, M.D.V. Harvard.
- Lewis, Janet K., A.B. Mt. Holyoke College, Cleveland, Ohio.
- Powers, John H. Student, Bates College, Lewiston, Maine.
- Proctor, Harriet T., A.B. Radcliffe College. Laboratory Technician, State Infirmary, Tewksbury, Mass.

- Smith, Ruth M., B.S. Oregon Agricultural College. Instructor, Iowa State College.
- Sun, K. C. Johns Hopkins Medical School.
- Swan, Horace C., M.D. Professor of Physiology and Medical Director, Trinity College, Hartford, Conn.
- Swift, D. B. Bates College. Laboratory Assistant, Base Hospital, Camp Devens, Mass.
- Taylor, Martha, A.B. Radcliffe College.
- Taylor, Marion F., A.B. Smith College. Investigator, Health Division, Bureau of Social Education, Y. W. C. A., New York.
- Townsend, Myron, B.S. Bates College. Sanitary Corps, U. S. Army, San Antonio, Texas.
- Thorpe, Priscilla A. Radcliffe College.
- Vieira, F. B., M.D. Rockefeller Institute.
- Wallace, Mary A., R.N. Superintendent, Nurses Training School, Nashua, N. H.
- Whitney, Elsie E., A.B. Radcliffe College. Instructor in Science, High School, Yarmouth, Mass.
- Wiley, A. G., A.B. Dartmouth College. Instructor in Biology, University of the South, Sewanee, Tenn.

OCTOBER, 1918-JUNE, 1919

- Anderson, Anna M. Boston University.
- Baker, Amy B., A.B. Boston University. Teacher, High School, Dorchester, Mass.
- Bristol, Gertrude R., A.B. Wellesley College.
- Brown, Bertha M., S.B. Massachusetts Institute of Technology.
- Burke, Arthur E. Watertown, Mass.
- Burlingame, Frances M., A.B. Radcliffe College.
- Capen, Ruth G., A.B. Smith College.
- Coon, Dr. Marion. Medical School, Boston University.
- Daniels, Marian, A.B. Radcliffe College. Teacher, High School, Dorchester, Mass.
- Dewire, Marjorie. Radcliffe College.
- Dougherty, Helen I., M.D. Woman's College of Pennsylvania.
- Eichorn, Gretchen. Army Nursing School.
- Fernald, Ethel, A.B. Radcliffe College. B.S., Simmons College.
- Hawley, Ethel R. Assistant Registrar of Vital Statistics, State Department of Public Health, Oklahoma City, Okla.
- Jardine, Janette G., A.B. Wellesley College. Laboratory Assistant, M. I. T.

- Jordan, C. Louise. Leslie Normal School, Cambridge.
 Kennedy, Harris, A.B. M.D., Harvard Medical School.
 Kuo, Yang Mo. Wusih, Kiang Su, China.
 Lord, Helen. Radcliffe College.
 Nichols, Hope. Mount Holyoke College.
 Ohrt, Frederick, C.E. Cornell University. Sanitary Engineer, Territorial Board of Health, Honolulu, Hawaii.
 Payson, Hazel A., B.S. Simmons College.
 Pierce, Louise V. Assistant Secretary Tuberculosis Investigations, 315 Oklahoman Building, Oklahoma City, Oklahoma.
 Pickels, Esther E., A.B. Mount Holyoke College.
 Pope, Alton S., A.B. Bowdoin College.
 Simon, Isaac B. B.Sc. Roxbury, Mass.
 Sindler, Bessie, A.B. Goucher College. X-Ray Laboratory, Army Medical School, Washington. Assistant, Dehydration Studies, U. S. Department of Agriculture.
 Stickney, Mrs. S. C. Lycée Fénélon, Paris.
 Whaley, Mrs. W. B. Charleston, S.C.

INDUSTRIAL HYGIENE

- Achorn, Ralph C., M.D. Boston, Mass.
 Coon, Marion, M.D. Boston, Mass.
 Doherty, Helen I., M.D. Boston, Mass.
 Fuller, Rhea Ruth, A.B. Los Angeles, Cal.
 Reiman, Clarence Kenworthy, D.Sc. Allston, Mass.
 Reiman, Harriet A. Allston, Mass.
 Richardson, Anna G., M.D. Boston, Mass.
 Shaw, Louis A. Boston, Mass.
 Walkley, William Samuel, M.D. Chelsea, Mass.
 Wright, Lucy, B.A. Boston, Mass.



